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SILVICULTURE ON THE UNB WOODLOT – A FINANCIAL ANALYSIS

Introduction

The evaluation comments from the "Managing Your Woodlot as a Business" workshop held in Fredericton on April 25,1998, indicated people wanted a "real-life" financial analysis of a silviculture strategy. This technical note compares four silvicultural strategies on the University of New Brunswick (UNB) woodlot.

In 1946, the Faculty of Forestry initiated a study to determine the long-term wood volume yields from a clearcut, a clearcut with a pre-commercial thinning, a selection harvest, and a "do nothing" treatment also known as a control. Data were recorded for 43 years until 1989. All four sites originated from a single stand of predominantly 60-year-old red spruce with an initial volume of 84 m^3/hectare (17 cords/acre). The two clearcuts were harvested during the first year. The pre-commercial thinning occurred at year 21, and the selection harvests were done during years 0, 19, and 43. Figure 1 shows the volume of wood either removed or left standing after 43 years. Clearly, the selection harvest treatment produced the most volume after 43 years.

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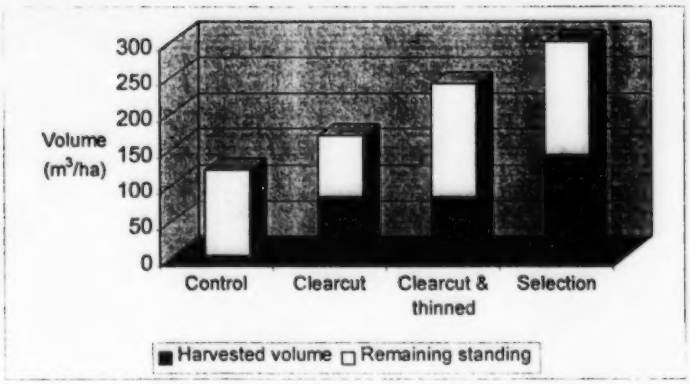

Figure 1. Volume Summary for the UNB Woodlot Harvesting Demonstration Site.

Financial Analysis

The financial analysis for the four treatments uses only costs associated with thinning and revenues in the form of stumpage. This simplifies the analysis and avoids having to consider costs such as harvesting and trucking. Stumpage was determined as a percentage of the mill-delivered price as shown in Table 1 - 25% for unmanaged stands and 33% for managed stands. The assumption that managed stands would receive a higher stumpage rate seems reasonable considering managed stands are usually composed of higher quality wood and can also be harvested more efficiently.

Average mill prices were obtained from local mills (Table 1). For example, the hardwood pulp price of $\$38.74/m^3$ was an average of the hardwood, birch, and poplar prices for St. Anne Nackawic Pulp Company Ltd.

The analysis uses "net present value" (NPV) to decide which treatment is the better investment. NPV is one of the most widely used measures of investment viability. NPV is the difference between the total discounted revenues and the total discounted costs. NPV is very sensitive to interest rates and the length of time of your investment – the higher the interest rates, the longer the wait to receive revenues – results in lower NPVs. From a financial perspective, the silviculture strategy with the highest NPV is the best choice, but in general any project that has a NPV greater than 0 is profitable or viable. Other variables used in the analysis were: the interest rate was 3%; the real stumpage price increase per year was 1%; the pre-commercial thinning cost of $549/ha was included within the clearcut & thin scenario, but a subsidy of 80% reduces this cost to $110/ha.

Table 1. Mill delivered and stumpage prices used in the financial analysis

Product	Mill Price ($/m³)	Stumpage Price($/m³)@ 25% mill price	Stumpage Price($/m³)@ 33% mill price
Hardwood pulp	38.74	9.69	12.78
Hardwood sawlog	84.56	21.14	27.90
Hardwood veneer	120.16	30.04	39.65
Softwood pulp	42.66	10.67	14.08
Softwood sawlog	80.72	21.18	22.54

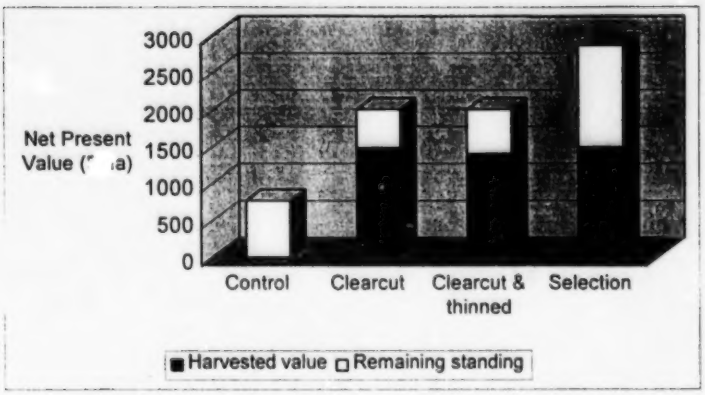

Figure 2. Financial Analysis of UNB Woodlot Harvesting Demonstration Site.

Results

The results show that on this particular site on the UNB woodlot, the selection harvest strategy produced a higher total value (Figure 2). The remaining standing volume (e.g., residual volume) was factored into the analysis even though it may or may not be cut or liquidated. Thinning did not increase the overall value on the clearcut area (although it did increase the overall volume) primarily due to the cost of carrying the pre-commercial thinning 24 years until harvest. The least preferred strategy for both volume and value was the "do-nothing" or control.

Concluding remarks

On this specific site, the selection harvest strategy produced the greatest total value. There was no value increase as a result of the pre-commercial thinning improvement, but there was a volume increase. The reason why there was no difference in value is due to the cost of carrying the pre-commercial thinning for 24 years before any harvest revenue is received. This underscores the importance of considering the time value of money.

In general, the longer the wait to receive revenue and the higher the cost early on, the lower the financial returns.

Financial returns can vary depending on many factors such as site quality, products produced, costs incurred, and revenues received. Each situation is unique and the results from this analysis should not be transferred to other sites with different characteristics.

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